**REMARKS**

The Final Office Action mailed April 20, 2009 ("Final Office Action"), has been received and reviewed. Claims 1-5, 7-16, 18-67, 69-90, and 94-119 are currently pending in the application. Claims 1-5, 7-16, 18-28, 31-65, 69-90, and 94-119 stand rejected. Claims 29, 30, 66, and 67 are withdrawn from consideration. Applicants have amended claims 1, 45, 57-65, 69-74, 87-90, 101-106, and 116-118 and respectfully request reconsideration of the application as amended herein.

Each of claims 1, 57, and 116-118 has been amended to recite "a non-azide, non-azole, non-aminoguanidine nitrate, non-triaminoguanidine nitrate composition" or "at least one non-azide, non-azole, non-aminoguanidine nitrate, non-triaminoguanidine nitrate gas generant." Applicants acknowledge that the as-filed specification does not explicitly describe that the gas generants are non-azole, non-aminoguanidine nitrate, non-triaminoguanidine nitrate compositions. However, a person of ordinary skill in the art would understand, based on the ingredients of the compositions described in the as-filed specification at least at paragraphs [0025]-[0035], that the compositions do not include azole, aminoguanidine nitrate, or triaminoguanidine nitrate ingredients. Dependent claim 45 has been amended to improve its form. Dependent claims 58-65, 69-74, 87-90, 101-106 have been amended to improve antecedent basis.

As an initial matter, Applicants note that the Examiner has failed to address or respond to the specific arguments set forth in Applicants' Pre-Appeal Brief filed on August 18, 2008, Amendment filed on March 13, 2008, and Amendment filed on March 2, 2009, other than to state that "Applicant[s'] arguments have been considered but are moot in view of the new ground(s) or rejection" or "Applicant[s'] amendment necessitated the new ground(s) of rejection." Office Action of October 1, 2008, p. 2 and Final Office Action, p. 7. Applicants submit that such an approach to examination is clearly contrary to established examination guidelines because it encourages piecemeal examination. Particularly, Applicants note that "[w]here the applicant traverses any rejection, the examiner should, if he or she repeats the rejection, take note of the applicant's argument and answer the substance of it." M.P.E.P. § 707.07(f) (emphasis added).

In order for Applicants to continue to advance prosecution, Applicants respectfully

request that the Examiner provide specific responses to the arguments presented herein.

**Information Disclosure Statement**

Applicants note the filing of an Information Disclosure Statement herein on January 28, 2009, and note that no copy of the PTO/SB/08A was returned with the outstanding Office Action. Applicants respectfully request that the information cited on the PTO/SB/08A be made of record herein.

**35 U.S.C. § 103(a) Obviousness Rejections**

<u>Obviousness Rejection Based on U.S. Patent No. 5,449,041 to Galbraith in View of U.S. Patent No. 6,416,599 to Yoshikawa *et al.*</u>

Claims 1-5, 7-14, 18, 22-25, 57-65, 69, 72-75, 77, 78, 96-106, and 115-119 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,449,041 to Galbraith ("Galbraith") in view of U.S. Patent No. 6,416,599 to Yoshikawa *et al.* ("Yoshikawa"). Applicants respectfully traverse this rejection, as hereinafter set forth.

To establish a *prima facie* case of obviousness, the prior art reference (or references when combined) must teach or suggest all of the claim limitations. *In re Royka*, 490 F.2d 981, 985 (CCPA 1974); *see also* M.P.E.P. § 2143.03. Additionally, the Examiner must determine whether there is "an apparent reason to combine the known elements in the fashion claimed by the patent at issue." *KSR Int'l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1740-1741, 167 L.Ed.2d 705, 75 USLW 4289, 82 U.S.P.Q.2d 1385 (2007). Further, rejections on obviousness grounds "cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *Id.* at 1741, quoting *In re Kahn*, 441, F.3d 977, 988 (Fed. Cir. 2006). Finally, to establish a *prima facie* case of obviousness, there must be a reasonable expectation of success. *In re Merck & Co., Inc.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986). Furthermore, the reason that would have prompted the combination and the reasonable expectation of success must be found in the prior art, common knowledge, or the nature of the problem itself, and not based on the Applicant's disclosure. *DyStar Textilfarben GmbH & Co. Deutschland KG v. C. H. Patrick Co.*, 464 F.3d 1356, 1367 (Fed. Cir. 2006); M.P.E.P. § 2144. Underlying the obvious determination is the fact that

statutorily prohibited hindsight cannot be used. *KSR*, 127 S.Ct. at 1742; *DyStar*, 464 F.3d at 1367.

The obviousness rejection of claims 1-5, 7-14, 18, 22-25, 57-65, 69, 72-75, 77, 78, 96-106, and 115-119 is improper because Galbraith and Yoshikawa do not teach or suggest all of the limitations of the claims. In addition, there is no reason to modify the references in the manner asserted by the Examiner.

Galbraith teaches a method and apparatus for suppressing a fire. Galbraith at column 1, lines 6-10. A solid propellant 14 in the apparatus is ignited to produce a first gas that includes carbon dioxide ("$CO_2$"), nitrogen, and water vapor. *Id.* at column 3, lines 3-5 and lines 64-67. The solid propellant is an azide-based or an azole-based mixture. *Id.* at column 4, line 23-column 5, line 11. In one embodiment of the apparatus, illustrated in FIG. 1, ignition of the solid propellant 14 produces a first gas 16, which is used to vaporize a vaporizable liquid 18 and form a second gas 24. *Id.* at column 3, lines 29-37. The second gas 24 is expelled from the apparatus and used to suppress a fire. *Id.* at column 5, lines 53-56. The solid propellant 14 is surrounded by a cooling material 38, such as magnesium carbonate. *Id.* at column 5, lines 29-32. When the cooling material 38 is heated, such as upon ignition of the solid propellant 14, additional $CO_2$ is generated. *Id.* at column 5, lines 32-34. In another embodiment of the apparatus, illustrated in FIG. 4, the first gas 16 produced by ignition of the solid propellant 14 is used directly as a fire suppressant. *Id.* at column 7, lines 41-44. The first gas 16 includes nitrogen, $CO_2$, and water vapor. Ignition of the solid propellant 14 also causes a magnesium carbonate containing propellant 72 to ignite, producing magnesium oxide and additional $CO_2$. *Id.* at column 7, lines 45-50. The first gas 16 and additional $CO_2$ flow through a magnesium carbonate cooling bed 76, which produces additional $CO_2$ upon heating. *Id.* at column 7, lines 51-54. A model of the embodiment of the apparatus illustrated in FIG. 4 describes that 3.1 pounds of $CO_2$ are produced by the magnesium carbonate containing propellant 72 and 6.9 pounds of $CO_2$ are produced by the magnesium carbonate cooling bed 76.

Yoshikawa teaches a gas generating agent that includes a nitrogenous organic compound, an oxidizing agent, and a metal nitride or metal carbide. Yoshikawa at column 3, lines 1-4. The nitrogenous organic compound is an azole, nitroguanidine, aminoguanidine, triaminoguanidine nitrate, dicyanamido, dicyandiamido, carbohydrazide, hydrazocarbonamido, azodicarbonamide,

oxamide, or ammonium oxalate. *Id.* at column 4, lines 6-14. When ignited, the gas generating agent produces nitrogen, $CO_2$, and water vapor. *Id.* at column 7, lines 51-54 and column 9, lines 23-28. The nitrogenous organic compound accounts for 20-50% of the gas generating agent. *Id.* at column 6, lines 20-22. The metal carbide accounts for 0.5-20% of the gas generating agent. *Id.* at column 9, lines 50-52. The gas generating agent is used in an air bag. *Id.* at column 1, lines 5-9.

As an initial matter, Applicants respectfully submit that the Examiner has mischaracterized the Yoshikawa reference. The Examiner states that because Yoshikawa does not "disclose producing carbon dioxide, it is obvious that any amount of carbon dioxide produced would be negligible if any is produced at all." Final Office Action, p. 2. Applicants disagree with this statement and note that Yoshikawa explicitly teaches that carbon dioxide is produced when the gas generating agent is combusted. See, for example column 7, lines 51-54 and column 9, lines 23-28 of Yoshikawa. Since the gas generating agent of Yoshikawa includes large amounts of carbon-containing ingredients, such as the nitrogenous organic compound or metal carbide, carbon dioxide is, necessarily, produced upon combustion of the gas generating agent.

Galbraith and Yoshikawa, alone or in combination, do not teach or suggest all of the limitations of claim 1 because neither reference teaches or suggests the limitation of "the at least one gas generant comprising a non-azide, non-azole, non-aminoguanidine nitrate, non-triaminoguanidine nitrate composition formulated to pyrotechnically produce no sodium chloride and an inert gas mixture comprising carbon dioxide at a concentration less than or equal to the Immediately Harmful to Life or Health concentration of carbon dioxide." Galbraith does not teach or suggest this limitation because its solid propellants are azide- or azole-based.

Yoshikawa also does not teach or suggest this limitation for the reasons set forth below. To determine the amount of $CO_2$ produced by the gas generating agents of Yoshikawa, NASA-Lewis Thermochemical code (also known as the Chemical Equilibrium with Applications ("CEA") program) was used to calculate the non-condensable combustion products of the gas generating agents of Yoshikawa. The NASA-Lewis Thermochemical code is available from NASA Glenn Research Center and is used to determine reaction products and reaction product concentrations from a given set of reactants. The amount of $CO_2$ calculated by the NASA-Lewis

Thermochemical code was then utilized to determine the amount of $CO_2$ present when the gas generating agents were delivered into a room. The NASA-Lewis calculations and the calculations to determine the amount of $CO_2$ present in the room were conducted by Dr. Reed Blau, one of the co-inventors of the present application. To provide an objective comparison with the claimed invention, the ingredients or reactants of the gas generating agents were selected based on the teachings of Yoshikawa such that relatively low amounts of $CO_2$ would be produced upon combustion of the gas generating agents.

The non-azole, nitrogenous organic compounds of Yoshikawa are listed in Table 1, along with the molecular weight and the percentage of carbon in each of the compounds. Aminotetrazole (ATZ) is included in Table 1 for comparative purposes.

Table 1: Non-azole nitrogenous organic compounds of Yoshikawa

| Compound | # Li | # C | # H | # O | # N | Total molecular weight | % Carbon |
|---|---|---|---|---|---|---|---|
| Aminotetrazole (ATZ) | 0 | 1 | 3 | 0 | 5 | 85.07 | 14.12 |
| Nitroguanidine | 0 | 1 | 4 | 2 | 4 | 104.07 | 11.54 |
| Aminoguanidine nitrate | 0 | 1 | 7 | 3 | 5 | 137.10 | 8.76 |
| Triaminoguanidine nitrate | 0 | 1 | 9 | 3 | 7 | 167.13 | 7.19 |
| Lithium dicyanoamide | 1 | 2 | 0 | 0 | 3 | 72.98 | 32.91 |
| Dicyandiamide | 0 | 2 | 4 | 0 | 4 | 84.08 | 28.57 |
| Carbohydrazide | 0 | 1 | 6 | 1 | 4 | 90.08 | 13.33 |
| Hydrazocarbonamide | 0 | 2 | 6 | 2 | 4 | 118.09 | 20.34 |
| Azodicarbonamide | 0 | 2 | 4 | 2 | 4 | 116.08 | 20.69 |
| Oxamide | 0 | 2 | 4 | 2 | 2 | 88.07 | 27.28 |
| Ammonium oxalate monohydrate | 0 | 2 | 10 | 5 | 2 | 142.11 | 16.90 |

As shown in Table 1, nitroguanidine, aminoguanidine nitrate, and triaminoguanidine nitrate are the nitrogenous organic compounds of Yoshikawa that have the lowest percentage of carbon. A

gas generating agent according to Yoshikawa that includes nitroguanidine, aminoguanidine nitrate, or triaminoguanidine nitrate as the nitrogenous organic compound would produce less $CO_2$ relative to a gas generating agent that includes dicyanamido, dicyandiamido, carbohydrazide, hydrazocarbonamido, azodicarbonamide, oxamide, or ammonium oxalate as the nitrogenous organic compound.

The NASA-Lewis Thermochemical code was used to determine the mole percent of $CO_2$ produced upon combustion of the gas generating agents listed in Table 2.

Table 2: Gas generating agent formulations used in NASA-Lewis Thermochemical calculations

| Fuel | % Fuel | % $Sr(NO_3)_2$ | % $Si_3N_4$ | % AlN | % Zinc stearate | % PVA[1] | Equivalence ratio | Mole % $CO_2$ at an equivalence ratio of 1.01 | Mole % $CO_2$ diluted in a room |
|---|---|---|---|---|---|---|---|---|---|
| ATZ (Example 5) | 31.0 | 63.0 | 3.4 | 2.6 | 0 | 0 | 1.015 | 13.8 | 5.9 |
| Aminoguanidine nitrate | 48.0 | 46.0 | 3.4 | 2.6 | 0 | 0 | 1.012 | 8.7 | 3.7 |
| Triaminoguanidine nitrate | 45.0 | 49.0 | 3.4 | 2.6 | 0 | 0 | 1.012 | 8.1 | 3.5 |
| Triaminoguanidine nitrate | 45.0 | 49.0 | 3.4 | 2.6 | 0.2 | 0.05 | 1.029 | 8.1 | 3.5 |
| Nitroguanidine | 47.0 | 47.0 | 3.4 | 2.6 | 0 | 0 | 1.015 | 15.1 | 6.4 |

[1] PVA=polyvinyl alcohol

The ingredients of the gas generating agents listed in Table 2 were selected based on the teachings of Yoshikawa such that relatively low amounts of $CO_2$ would be produced upon combustion of the gas generating agents. The gas generating agents in Table 2 are similar to Example 5 of Yoshikawa, except the former formulations include nitroguanidine, aminoguanidine nitrate, or triaminoguanidine nitrate as the nitrogenous organic compound rather than AZT. Example 5 of Yoshikawa was selected as an exemplary formulation for conducting the thermochemical calculations because the formulation has an equivalence ratio of 1.01 and includes a metal nitride ($Si_3N_4$) rather than a metal carbide, the latter of which would artificially increase the amount of $CO_2$ produced. Nitroguanidine, aminoguanidine nitrate, or triaminoguanidine nitrate was selected as the nitrogenous organic compound because these nitrogenous organic compounds include low amounts of carbon relative to the other nitrogenous organic compounds of Yoshikawa. For similar reasons, a metal nitride was selected to be present

in the gas generating agents, rather than a metal carbide. Such gas generating agents, including nitroguanidine, aminoguanidine nitrate, or triaminoguanidine nitrate and a metal nitride, would be expected to produce lower amounts of $CO_2$ than formulations containing the other nitrogenous organic compounds of Yoshikawa and a metal carbide, providing an objective comparison to the claimed invention. The relative amounts of fuel and strontium nitrate present in each of the nitroguanidine, aminoguanidine nitrate, or triaminoguanidine nitrate formulations were selected to achieve an equivalence ratio of approximately 1.015, which is the equivalence ratio of the formulation of Example 5.

The amount of $CO_2$ produced by the gas generating agents listed in Table 2 is shown in the second to last column of Table 2. As shown in Table 2, the mole percent of $CO_2$ produced when the formulation of the aminoguanidine nitrate formulation was combusted was calculated to be 8.7%, the mole percent of $CO_2$ produced when each of the triaminoguanidine nitrate formulations was combusted was calculated to be 8.1%, and the mole percent of $CO_2$ produced when the nitroguanidine formulation was combusted was calculated to be 15.1%. For comparative purposes, the gas generating agent of Example 5, which includes AZT, is also listed in Table 2 and the mole percent of $CO_2$ produced when this formulation was combusted was calculated to be 13.8%.

To extinguish a fire, the gases produced by combustion of each of the formulations in Table 2 must reduce the oxygen content in a room from 20.95% (oxygen content of the atmosphere (air)) to 12%. After the gases produced by combustion of each of the formulations in Table 2 displace the original amount of air to dilute the oxygen content in the room to 12%, the fraction of air in the room is 0.573 (12%/20.95%). Thus, the fraction of gases produced by combustion of each of the formulations in Table 2 in the room is 0.427 (1-0.573). Multiplying the calculated mole percent of $CO_2$ (in the second to last column of Table 2) by 0.427 provides the mole percent of $CO_2$ diluted in a room (in the last column of Table 2). As shown in the last column of Table 2, the nitroguanidine formulation produced 6.4 mole percent of $CO_2$ diluted in the room, which is greater than the Immediately Harmful to Life or Health concentration of carbon dioxide (4%). The aminoguanidine nitrate formulation and the triaminoguanidine nitrate formulations produced 3.7 and 3.5 mole percent of $CO_2$, respectively, which is less than the Immediately Harmful to Life or Health concentration of carbon dioxide (4%). However, since

claim 1 recites that the gas generant is a non-aminoguanidine nitrate, non-triaminoguanidine nitrate composition, Yoshikawa does not teach or suggest the above-mentioned limitation.

Galbraith and Yoshikawa, alone or in combination, also do not teach or suggest the limitation of "the fire suppression system configured to dispel, at an exit thereof, the inert gas mixture to provide a dispelled inert gas mixture into a space, the dispelled inert gas mixture comprising carbon dioxide in a concentration substantially equal to the concentration pyrotechnically produced by the at least one gas generant." Galbraith does not teach or suggest this limitation because its apparatus includes cooling material 38, magnesium carbonate containing propellant 72, and/or magnesium carbonate cooling bed 76, each of which produces $CO_2$ when heated, such as upon ignition of the solid propellant 14. The $CO_2$ produced by the cooling material 38, magnesium carbonate containing propellant 72, or magnesium carbonate cooling bed 76 is in addition to the $CO_2$ produced by ignition of the solid propellant 14. The $CO_2$ produced by ignition of the solid propellant 14 and the $CO_2$ produced by the cooling material 38, magnesium carbonate containing propellant 72, and/or magnesium carbonate cooling bed 76 exit the apparatus and are used to suppress the fire. Since the gases exiting the apparatus of Galbraith include $CO_2$ in addition to the $CO_2$ produced by the solid propellant 14, Galbraith does not teach or suggest that "the dispelled inert gas mixture compris[es] carbon dioxide in a concentration substantially equal to the concentration pyrotechnically produced by the at least one gas generant." Yoshikawa does not cure this deficiency in Galbraith because Yoshikawa does not teach or suggest a fire suppression system that is configured to dispel an inert gas mixture comprising carbon dioxide in a concentration substantially equal to the concentration pyrotechnically produced by the at least one gas generant.

In addition, there is no reason in the applied references, common knowledge, or the nature of the problem itself to modify the references in the manner asserted by the Examiner. The Examiner states "[i]t would have been obvious . . . to have modified the device of Galbraith et al. by using a non-azide, non-azole composition to produce an inert gas mixture as has been taught by Yoshikawa et al. to produce a safe gas mixture." Final Office Action, p. 3. However, even if the apparatus of Galbraith was modified to include the composition of Yoshikawa, the claimed invention would not be produced because additional $CO_2$ would be produced by the cooling material 38, magnesium carbonate containing propellant 72, and/or magnesium

carbonate cooling bed 76. As such, the apparatus of Galbraith, as modified by Yoshikawa, would not produce a dispelled inert gas mixture comprising carbon dioxide in a concentration substantially equal to the concentration pyrotechnically produced by the at least one gas generant.

Dependent claims 2-5, 7-14, 18, 22-25, 96-100, and 115 are allowable, *inter alia*, as depending from allowable claim 1.

Galbraith and Yoshikawa, alone or in combination, do not teach or suggest all of the limitations of claim 57 because neither reference teaches or suggests the limitations of "igniting at least one non-azide, non-azole, non-aminoguanidine nitrate, non-triaminoguanidine nitrate gas generant to produce an inert gas mixture comprising carbon dioxide" and "dispersing the inert gas mixture into a space to extinguish a fire, the dispersed inert gas mixture comprising carbon dioxide in a concentration substantially equal to the concentration produced by ignition of the at least one gas generant such that the space comprises carbon dioxide at a concentration less than or equal to the Immediately Harmful to Life or Health concentration of carbon dioxide." Galbraith and Yoshikawa do not teach or suggest these limitations for substantially the same reasons as discussed above with respect to claim 1.

In addition, there is no reason in the applied references, common knowledge, or the nature of the problem itself to modify the references in the manner asserted by the Examiner for substantially the same reasons as discussed above with respect to claim 1.

Dependent claims 58-65, 69, 72-75, 77, 78, and 101-106 are allowable, *inter alia*, as depending from allowable claim 57.

Galbraith and Yoshikawa, alone or in combination, do not teach or suggest all of the limitations of claim 116 because neither reference teaches or suggests the limitation of "at least one non-azide, non-azole, non-aminoguanidine nitrate, non-triaminoguanidine nitrate gas generant" for substantially the same reasons as discussed above with respect to claim 1.

Galbraith and Yoshikawa, alone or in combination, also do not teach or suggest the limitation in claim 116 of "the fire suppression system configured to dispel, at an exit thereof, the first gas mixture and a second gas mixture comprising carbon dioxide into a space to provide carbon dioxide at a concentration less than or equal to the Immediately Harmful to Life or Health concentration of carbon dioxide in the space." Galbraith does not teach or suggest this limitation because $CO_2$ is produced by the cooling material 38, magnesium carbonate containing

propellant 72, or magnesium carbonate cooling bed 76, and the solid propellant 14. Nothing in Galbraith teaches or suggests that the $CO_2$ produced by the cooling material 38, magnesium carbonate containing propellant 72, or magnesium carbonate cooling bed 76 combined with the $CO_2$ produced by the solid propellant 14 is dispelled into a space at a concentration less than or equal to the Immediately Harmful to Life or Health concentration of carbon dioxide. Rather, since the gases exiting the apparatus of Galbraith include $CO_2$ from the cooling material 38, magnesium carbonate containing propellant 72, or magnesium carbonate cooling bed 76 and from the solid propellant 14, the $CO_2$ dispelled by the apparatus would be at a concentration greater than the Immediately Harmful to Life or Health concentration of carbon dioxide.

Yoshikawa does not cure the deficiency in Galbraith because nothing in Yoshikawa teaches or suggests a fire suppression system that is configured to dispel, at an exit thereof, the first gas mixture and a second gas mixture comprising carbon dioxide into a space to provide carbon dioxide at a concentration less than or equal to the Immediately Harmful to Life or Health concentration of carbon dioxide in the space.

In addition, there is no reason in the applied references, common knowledge, or the nature of the problem itself to modify the references in the manner asserted by the Examiner for substantially the same reasons as discussed above with respect to claim 1.

Galbraith and Yoshikawa, alone or in combination, do not teach or suggest all of the limitations of claim 117 because neither reference teaches or suggests the limitations of "at least one non-azide, non-azole, non-aminoguanidine nitrate, non-triaminoguanidine nitrate gas generant" and "the fire suppression system configured to dispel, at an exit thereof, at least a portion of the inert gas mixture, the dispelled inert gas mixture comprising carbon dioxide in a concentration equal to the concentration pyrotechnically produced by the at least one non-azide, non-azole gas generant." Galbraith does not teach or suggest these limitations for substantially the same reasons as discussed above with respect to claims 1 and 116. Specifically, Galbraith does not teach or suggest the former limitation for substantially the same reasons as discussed above with respect to claim 1. Galbraith also does not teach or suggest that the inert gas mixture, which its apparatus is configured to dispel, comprises carbon dioxide in a concentration equal to the concentration pyrotechnically produced by the at least one non-azide, non-azole gas generant. Rather, Galbraith teaches the addition of $CO_2$ from its cooling material 38, magnesium

carbonate containing propellant 72, or magnesium carbonate cooling bed 76. Yoshikawa does not cure the deficiency in Galbraith because Yoshikawa does not teach that the fire suppression system is configured to dispel, at an exit thereof, at least a portion of the inert gas mixture, the dispelled inert gas mixture comprising carbon dioxide in a concentration equal to the concentration pyrotechnically produced by the at least one non-azide, non-azole gas generant.

In addition, there is no reason in the applied references, common knowledge, or the nature of the problem itself to modify the references in the manner asserted by the Examiner for substantially the same reasons as discussed above with respect to claim 1.

Galbraith and Yoshikawa, alone or in combination, do not teach or suggest all of the limitations of claim 118 because neither reference teaches or suggests the limitations of "a non-azide, non-azole, non-aminoguanidine nitrate, non-triaminoguanidine nitrate composition" and "the fire suppression system configured to dispel, at an exit thereof, the inert gas mixture as pyrotechnically produced into a space, the space comprising carbon dioxide at less than approximately 4% by volume." Galbraith and Yoshikawa do not teach or suggest these limitations for substantially the same reasons as discussed above with respect to claims 1 and 116.

<u>Obviousness Rejection Based on Galbraith in View of Yoshikawa and Further in View of U.S. Patent No. 5,538,568 to Taylor *et al.* and U.S. Patent No. 5,882,036 to Moore *et al.*</u>

Claims 15, 70, 79, 80, 94, and 95 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Galbraith in view of Yoshikawa, and further in view of U.S. Patent No. 5,538,568 to Taylor *et al.* ("Taylor") and U.S. Patent No. 5,882,036 to Moore *et al.* ("Moore"). Applicants respectfully traverse this rejection, as hereinafter set forth.

The teachings of Taylor and Moore are summarized on p. 21 of the January 11, 2007 Response.

The nonobviousness of independent claims 1 and 57 precludes a rejection of the above-mentioned claims, which depends therefrom, because a dependent claim is obvious only if the independent claim from which it depends is obvious. *See* <u>In re Fine</u>, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988), *see also* M.P.E.P. § 2143.03.

As such, dependent claims 15, 70, 79, 80, 94, and 95 are allowable, *inter alia*, as depending from an allowable base claim.

Obviousness Rejection Based on Galbraith in View of Yoshikawa and Further in View of Taylor and U.S. Patent No. 6,481,746 to Hinshaw *et al.*

Claims 16, 71, and 81-90 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Galbraith in view of Yoshikawa, and further in view of Taylor and U.S. Patent No. 6,481,746 to Hinshaw *et al.* ("Hinshaw"). Applicants respectfully traverse this rejection, as hereinafter set forth.

The teachings of Hinshaw are summarized on p. 27 of the March 2, 2009 Response.

The nonobviousness of independent claims 1 and 57 precludes a rejection of the above-mentioned claims, which depends therefrom, because a dependent claim is obvious only if the independent claim from which it depends is obvious. *See* In re Fine, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988), *see also* M.P.E.P. § 2143.03.

As such, dependent claims 16, 71, and 81-90 are allowable, *inter alia*, as depending from an allowable base claim.

Obviousness Rejection Based on Galbraith in View of Yoshikawa et al. and Further in View of U.S. Patent No. 5,739,460 to Knowlton *et al.*

Claims 19-21 and 76 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Galbraith in view of Yoshikawa, and further in view of U.S. Patent No. 5,739,460 to Knowlton *et al.* ("Knowlton"). Applicants respectfully traverse this rejection, as hereinafter set forth.

The teachings of Knowlton are summarized on p. 24 of the January 11, 2007 Response.

The nonobviousness of independent claims 1 and 57 precludes a rejection of the above-mentioned claims, which depends therefrom, because a dependent claim is obvious only if the independent claim from which it depends is obvious. *See* In re Fine, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988), *see also* M.P.E.P. § 2143.03.

As such, dependent claims 19-21 and 76 are allowable, *inter alia*, as depending from an allowable base claim.

Obviousness Rejection Based on Galbraith in View of Yoshikawa and Further in View of U.S. Patent No. 6,116,348 to Drakin

Claims 26-28, 31-45, 48, 49, and 53-56 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Galbraith in view of Yoshikawa, and further in view of U.S. Patent No. 6,116,348 to Drakin ("Drakin"). Applicants respectfully traverse this rejection, as hereinafter set forth.

The teachings of Drakin are summarized on p. 20 of the October 31, 2007 Response.

The nonobviousness of independent claim 1 precludes a rejection of the above-mentioned claims, which depends therefrom, because a dependent claim is obvious only if the independent claim from which it depends is obvious. *See* In re Fine, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988), *see also* M.P.E.P. § 2143.03.

As such, dependent claims 26-28, 31-45, 48, 49, and 53-56 are allowable, *inter alia*, as depending from an allowable base claim.

Obviousness Rejection Based on Galbraith in View of Yoshikawa and Drakin and Further in View of Taylor and Moore

Claim 46 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Galbraith in view of Yoshikawa, and Drakin, and further in view of Taylor, and Moore. Applicants respectfully traverse this rejection, as hereinafter set forth.

The nonobviousness of independent claim 1 precludes a rejection of the above-mentioned claims, which depends therefrom, because a dependent claim is obvious only if the independent claim from which it depends is obvious. *See* In re Fine, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988), *see also* M.P.E.P. § 2143.03.

As such, dependent claim 46 is allowable, *inter alia*, as depending from an allowable base claim.

Obviousness Rejection Based on Galbraith in View of Yoshikawa and Drakin and Further in View of Taylor and Hinshaw

Claim 47 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Galbraith in view of Yoshikawa, and Drakin, and further in view of Taylor, and Hinshaw. Applicants respectfully traverse this rejection, as hereinafter set forth.

The nonobviousness of independent claim 1 precludes a rejection of the above-mentioned claims, which depends therefrom, because a dependent claim is obvious only if the independent claim from which it depends is obvious. *See* In re Fine, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988), *see also* M.P.E.P. § 2143.03.

As such, dependent claim 47 is allowable, *inter alia*, as depending from an allowable base claim.

Obviousness Rejection Based on Galbraith in View of Yoshikawa and Drakin and Further in View of Taylor and Knowlton

Claims 50-52 and 76 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Galbraith in view of Yoshikawa, and Drakin, and further in view of Taylor, and Knowlton. Applicants respectfully traverse this rejection, as hereinafter set forth.

The nonobviousness of independent claims 1 and 57 precludes a rejection of the above-mentioned claims, which depends therefrom, because a dependent claim is obvious only if the independent claim from which it depends is obvious. *See* In re Fine, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988), *see also* M.P.E.P. § 2143.03.

As such, dependent claims 50-52 and 76 are allowable, *inter alia*, as depending from an allowable base claim.

Obviousness Rejection Based on Galbraith in View of Yoshikawa and Further in View of Hinshaw

Claims 107-114 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Galbraith in view of Yoshikawa, and further in view of Hinshaw. Applicants respectfully traverse this rejection, as hereinafter set forth.

The obviousness rejection of claims 107-114 is improper because the applied references do not teach or suggest all of the claim limitations. In addition, there is no reason in the applied references, common knowledge, or the nature of the problem itself to combine the applied references in the manner asserted by the Examiner.

The applied references do not teach or suggest the limitation in claim 107 of "the fire suppression system configured to dispense, at an exit thereof, the inert gas mixture comprising carbon dioxide in a concentration substantially equal to the concentration pyrotechnically produced by the at least one gas generant." Galbraith and Yoshikawa do not teach or suggest this limitation for substantially the same reasons as discussed above for claim 1. Hinshaw does not cure this deficiency in Galbraith and Yoshikawa because nothing in Hinshaw teaches a fire suppression system that is configured to dispense an inert gas mixture comprising carbon dioxide in a concentration substantially equal to the concentration pyrotechnically produced by the at least one gas generant.

In addition, there is no reason in the applied references, common knowledge, or the nature of the problem itself to modify the references in the manner asserted by the Examiner. The Examiner states "[i]t would have been obvious . . . to have made the gas generant of Galbraith and Yoshikawa et al. comprising a combination of the elements as taught by Taylor et al. and Hinshaw et al. since Taylor et al. and Hinshaw et al. teach such elements for forming a gas generant are know[n] in the art and the combination of these elements would properly form a gas generant." Final Office Action, p. 7. While the Examiner's reason for combining the applied references refers to Taylor, Applicants herein treat the obviousness rejection as being in light of Galbraith, Yoshikawa, and Hinshaw since the Examiner did not specifically include Taylor in the obviousness rejection. The mere fact that references <u>can</u> be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. M.P.E.P. § 2143.01 (emphasis in original). Since nothing in Galbraith, Yoshikawa, or Hinshaw suggests the desirability of the combination, the Examiner's reason for combining the applied references appears to be a hindsight attempt to gather elements for bringing them together with the benefit of Applicants' disclosure.

Dependent claims 108-114 are allowable, *inter alia*, as depending from an allowable base claim.

## ENTRY OF AMENDMENTS

The amendments to claims 1, 45, 57-65, 69-74, 87-90, 101-106, and 116-118 should be entered by the Examiner because the amendments are supported by the as-filed specification and drawings and do not add new matter to the application.

Applicants consider claims 1 and 57 to be generic, and note that upon allowance of a generic claim, claims depending therefrom in a non-elected species, namely claims 29, 30, 66, and 67, would also be allowable.

## CONCLUSION

Claims 1-5, 7-16, 18-67, 69-90, and 94-119 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, the Examiner is respectfully invited to contact Applicants' undersigned attorney.

Respectfully submitted,

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